



Construction & Demolition (C&D) Materials Management in the Northeast in 2013

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Prepared by the NEWMOA C&D Materials Management Workgroup

State environmental agencies in the Northeast have a responsibility to monitor and manage construction and demolition (C&D) materials processing and disposal capacity. To fulfill this responsibility, they gather data from the C&D materials processing, transfer, and disposal facilities that they regulate on the source of their incoming material, including imports from other states and the destination of outgoing material. This information helps them assess disposal capacity and measure recycling and other waste diversion activities.

This document builds upon NEWMOA's 2009 *Construction & Demolition Waste Management in the Northeast in 2006* report. The figures displayed below present available regional C&D materials management information for calendar years 2006 and 2013. The data is presented in three categories: disposal, landfill uses, and recovery. Landfill uses include shaping and grading, road base, and alternative daily cover (ADC). Landfill uses are reported separately because they are not considered recovery in this data presentation. The data included in this write-up covers only C&D materials that passed through a facility that reports to a state. For example, data on source-separated material sent directly from a C&D job site to a recycling facility, such as a metal scrap yard, is generally not available and, therefore, is not included in the figures on generation or recovery. Each graph that presents 2013 data is followed by one covering the same information from NEWMOA's report on 2006 data.

This presentation focuses on the management of C&D materials in the Northeast U.S., including Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, and Vermont. Imports from and exports to non-NEWMOA states and/or Canadian provinces are aggregated into the "Non-NEWMOA" category in the figures.

Generally, the definition of C&D materials includes wood, brick, concrete, asphalt pavement, metal, drywall, and asphalt shingles generated during the construction, remodeling, or demolition of structures. C&D projects can generate other wastes, such as plastic buckets, pipe and wrap, cardboard boxes, plumbing, electrical and other fixtures, wire, and rocks and soil that are also sent for disposal or processing. These other materials are excluded to the extent feasible in the data regarding processing facility inputs and outputs presented below. At disposal facilities these other materials are typically not identified separately and are therefore included in the C&D waste disposal data. Generally, interior finishing items, such as carpets and furniture, are also not considered C&D waste, but in practice could be included in demolition waste. Data on the recovery of these "other" wastes is not included in this presentation.

This presentation only includes available data from processing facilities that handle mixed C&D materials from building construction, renovation, and demolition projects. NEWMOA excluded data from facilities that only process material from road and bridge projects and from facilities that exclusively process material from land clearing projects, to the extent feasible. The quantity and weight of asphalt, brick, and concrete (ABC) generated by road and bridge projects often dwarfs the amount generated from other sources, particularly architectural sources. Facilities that handle mixed C&D materials received and recovered ABC materials from building projects and data on ABC from these facilities is included in this presentation. Likewise, some processors of mixed C&D materials also received land clearing debris, and data on clean wood recovery from these facilities is included. Clean wood can also include shipping pallets and lumber from new construction or from uncoated lumber from renovation and demolition projects.

Construction & Demolition Materials Workgroup

The purpose of NEWMOA's Construction and Demolition Materials [Workgroup](#) is to oversee NEWMOA's C&D materials data collection and analysis and the development of this presentation, and to share other information and lessons learned about the management of this large and important waste stream. The NEWMOA states' solid waste program directors appoint representatives to serve on its Workgroup.

Data Analysis Methodology

NEWMOA followed the data quality assurance procedures in its EPA-approved [Quality Management Plan](#) (www.newmoa.org/about/2016QMP.pdf) to prepare this presentation. Workgroup members shared summaries of the C&D materials data collected from regulated facilities when it became available. Prior to sending NEWMOA staff their state's data, the Workgroup members conducted their own quality assurance review. Each state program shared their data in different formats, with some state programs sharing data from individual disposal, transfer, and processing facilities, and some providing data that they aggregated across facilities. NEWMOA staff reviewed, evaluated, and aggregated this data and contacted the appropriate Workgroup member with any questions.

NEWMOA staff entered the aggregated data into a Microsoft Excel spreadsheet and prepared draft figures. The Workgroup members reviewed a draft of the data, figures, and text and provided comments and corrections. After the NEWMOA staff made the recommended corrections, a revised draft was shared with the NEWMOA [Board of Directors](#) and the Solid Waste and Sustainable Materials Management [Steering Committee](#) for their review and approval prior to publication online.

Data Caveats

Workgroup members addressed discrepancies that arose after NEWMOA staff compiled the C&D materials spreadsheet and reviewed the results. A typical discrepancy involves a situation where the waste export data from transfer facilities in one state differed from import data from disposal facilities in another state. Unless otherwise noted below¹, the figures that present disposal data are based on information from the disposal facilities, since the Workgroup

¹ 2013 disposal facility data was supplemented by data provided by CT DEEP for exports to MA, NY, and RI from CT, and by VT DEC for NH and NY imports from VT.

considers their data to be most accurate. When supporting data is available, NEWMOA staff adjusted the submitted data for various reasons, including:

- If a C&D materials load is hauled directly to an out-of-state processing facility, disposal facility or transfer station, the material does not pass through a regulated facility in the state of origin (called the generating state) and, therefore, that generating state does not receive a report on it.
- When C&D materials are transported from a facility in the generating state to a processing facility or transfer station in another state, and then from there the outputs are sent to another facility (either in that second state or to a third state) for further processing or disposal. That receiving facility might record the C&D material as originating in the second state rather than the generating state.
- Possible double-counting can occur when a transfer station or processing facility transfers some, or all of its incoming material to another processing facility within that same state. This material might be counted as “new” incoming material to each facility when it should only be counted once.
- When states used different terms for similar materials, as illustrated in the following table regarding wood:

State	Name Used in Processing Facility Data Reported to NEWMOA	Counted as “Clean Wood” in this report	Counted as “C&D Wood” in this report
CT	Wood	X	
ME	CDD Wood Fuel Chip		X
	CDD Treated Wood		X
	Wood from CDD		X
	Wood Waste Fuel Chip	X	
	Land-clearing/Wood Waste	X	
MA	Wood C&D		X
	Wood Waste	X	
NH	C&D Wood		X
	Unadulterated Wood	X	
NY	Wood (chips)		X
	Wood (unadulterated)	X	
	Wood (unadulterated pallets)	X	
RI	Landscaping Chips	X	
	Wood Fuel		X

By carefully reviewing the available C&D materials data, NEWMOA staff identified and adjusted for these situations to the extent feasible, and the figures reflect these and other corrections.

Notes on the States’ Data

The following sections highlight unique features regarding states’ C&D materials data that should be noted when reviewing the figures below.

Connecticut: The Department of Energy and Environmental Protection (DEEP) does not receive reports from processing facilities on the quantity of exported material that is used as ADC instead of disposal. Therefore, all exports are reported as disposed of, and this could over-report disposal and under-report landfill use for Connecticut.

New Jersey: The Department of Environmental Protection (DEP) collects extensive data on the outputs from processing facilities that manage C&D and other materials, but does not collect data on the sources of the incoming material, which could be municipal solid waste, road and bridge project ABC, building project C&D materials, or other sources. Therefore, for New Jersey, this presentation only includes data on C&D waste disposal and does not include information regarding processing and recovery.

New York State: The Department of Environmental Conservation (DEC) collects data from C&D materials processing facilities that include many that process road and bridge, and land clearing materials. NEWMOA removed data from facilities that deal primarily with these materials. However, NEWMOA's staff was unable to resolve discrepancies between the quantity of material reportedly received versus removed at several facilities. This creates uncertainty in the data reported for New York. In 2006, recovery data for New York included "other" materials, such as paper, plastic, rock, and soil. In the 2013 presentation, this material was excluded.

Data regarding processing facility outputs is categorized in the DEC system as "destination", "recovered", and "transferred". Generally, "destination" means sent for disposal, "recovered" means recovery for reuse/recycling, and "transferred" means transferred for further processing. However, by examining the facility-specific data it became clear that several processing facilities were reporting recovered material as transferred when it was sent to a recycling facility. NEWMOA staff adjusted the data to account for this to the extent feasible.

Rhode Island: The accuracy of the data reported to the Department of Environmental Management (DEM) from the largest C&D processor in Rhode Island is questionable, and therefore, the quantity of material received from in-state and out-of-state sources for processing and the quantities recovered and disposed of might be under-reported.

Vermont: There were no C&D materials processing facilities in Vermont in 2006 and 2013. Some transfer stations and disposal facilities did recover some C&D materials for use at landfills as road base and alternative daily cover (ADC). Data on these uses in Vermont is included in the processing facility output "landfill uses" category. C&D materials processing facilities began operating in Vermont in 2014 and are now diverting material from disposal.

NEWMOA's *Construction & Demolition Waste Management in the Northeast in 2006* presentation noted that "The availability and quality of data regarding C&D waste management is not consistent among the Northeast states making aggregation and comparisons challenging." After NEWMOA published the report in 2009, the Association undertook an initiative focused on developing common terminology for C&D materials and a common scope of information to use in the reports that C&D processing facilities submit to states. This common set of terms and information requested from processing facilities was implemented by the New Hampshire

Department of Environmental Services (DES) and greatly improved the usefulness of the data they provided to NEWMOA. Other states were unable to implement the agreed upon terminology and scope of data to request from facilities, and therefore, aggregating and analyzing the 2013 data remained challenging.

Observations

C&D Waste Generated & Disposed of in the Northeast

The quantity of C&D waste generated in 2013 that was disposed of was an estimated 8.33 million tons, approximately the same amount as in 2006 (8.47 million tons). If New Jersey and New York are excluded, the quantity of C&D waste disposed of by the New England states was 36 percent less in 2013 than in 2006 (2.08 and 3.24 million tons, respectively). The amount of C&D waste requiring disposal is affected by economic activity and trends and the availability of recycling and landfill use markets and infrastructure.

Imports & Exports for Disposal

Figure 1 shows that all of the Northeast states export C&D waste to facilities in other NEWMOA states for disposal, and disposal facilities in all of the NEWMOA states import C&D materials from other northeast states. In 2006 and 2013, facilities in Connecticut, Massachusetts, and Vermont exported more C&D waste for disposal in other NEWMOA states than they imported. Likewise, in 2006 and 2013, facilities in Maine, New Hampshire, New Jersey, New York, and Rhode Island imported more C&D waste for disposal than they exported to other NEWMOA states. Figure 1 also shows that Connecticut, Massachusetts, New Jersey, and New York relied on facilities in states outside the NEWMOA region for disposal of significant quantities of C&D waste in 2006 and 2013.

Quantity Generated & Disposed of by State

Figure 2 presents the quantity of C&D waste generated in a state that was disposed of, and the breakdown of where it went. In 2013:

- Region-wide, 56 percent remained in the state of origin for disposal, ranging from 97 percent for Maine, New Hampshire, and Rhode Island, to 15 percent for Connecticut.
- Region-wide, 5 percent was exported from the state of origin to another state within the region for disposal. New Jersey did not export to any NEWMOA states for disposal. Maine and New York shipped 1 percent of their waste, and New Hampshire and Rhode Island sent 3 percent. Whereas, facilities in Vermont sent 36 percent, and Connecticut and those in Massachusetts sent 25 percent for disposal in other NEWMOA states.
- Region-wide, 39 percent was exported to disposal facilities outside of the region, ranging from 68 percent from New York and 61 percent from Connecticut to 2 percent from Maine and zero from New Hampshire, Rhode Island, and Vermont.
- Compared to 2006, the quantity of C&D materials generated in Connecticut, Maine, Massachusetts, New Hampshire, and Vermont that was disposed of was significantly lower in 2013, while for New Jersey the quantity was roughly the same. The quantities generated in New York and Rhode Island that were disposed of increased. Of particular note, in 2013, the quantity of C&D waste exported from Connecticut to facilities in states outside of the northeast was approximately half that of the 2006 quantity (555,000 tons versus 1,076,000 tons).

Quantity Disposed in Each State

Figure 3 presents the quantities of C&D waste disposed of in each state and the breakdown of where it came from. Throughout the northeast, the majority of waste disposed in each state originates in that state. In 2013, the overall quantity of C&D waste disposed in Maine, Massachusetts, New Jersey, and Vermont was approximately 50 percent less than in 2006. The quantity disposed in New Hampshire decreased by approximately 25 percent. For Connecticut, the quantity was roughly the same, and for New York and Rhode Island the quantities increased. Of particular note, in 2013, the quantity of C&D waste disposed in Maine that originated in another state was 210,000 tons less than in 2006, an 82 percent reduction.

Processing Facility Inputs

Figure 4 presents the quantities of C&D materials handled by processing facilities in each state and a breakdown of where it came from. Compared to 2006, the quantity of C&D materials processed in 2013 was less for all states, except for Maine and Rhode Island where it increased slightly. In 2013, processors in Maine, New Hampshire, and Rhode Island received more than half of their incoming material from out-of-state, whereas facilities in Connecticut, Massachusetts, and New York processed primarily in-state generated material.

Processing Facility Outputs

Figure 5 shows the fate of C&D material leaving processing facilities, broken down by disposal, landfill use, and recovery.

- Disposal: regionwide, in 2013, the total quantity of C&D materials leaving processors for disposal was 15 percent less than in 2006. Of particular note, the quantity sent for disposal by processors in Connecticut and Massachusetts were each approximately 200,000 tons less than in 2006, a 19 percent reduction for Connecticut and a 67 percent reduction for Massachusetts.
- Landfill Use: regionwide, in 2013 the total quantity of C&D waste sent for landfill use was 329,000 tons less than in 2006, a 21 percent reduction. The total quantity sent for landfill use in 2013 from facilities in Maine, New Hampshire, and Rhode Island was more than in 2006. For Massachusetts and New York, less C&D waste was shipped for landfill use. Processor outputs for landfill uses decreased by over 350,000 tons in Massachusetts, a 64 percent reduction and by over 145,000 tons in New York, a 23 percent reduction. Facilities in Maine sent almost 100,000 tons more material for landfill uses in 2013 compared to 2006, a 360 percent increase.
- Recovery: regionwide, the total quantity of C&D materials recovered for reuse/recycling by processors in the northeast states was 1.13 million tons in 2013, approximately 800,000 tons less than in 2006. If New York is excluded, the quantity of C&D materials recovered (for the New England states) was slightly greater in 2013 than in 2006 (510,000 tons versus 485,000 tons, respectively). Regionwide, in 2013 approximately 19 percent of incoming material was recovered by processing facilities for reuse/recycling, ranging from 46 percent in Massachusetts to 6 percent in Connecticut. Compared with 2006, percent recovery as well as overall tonnages recovered in Maine, New Hampshire, New York, and Rhode Island was lower than in 2013. Massachusetts was the only state where processors increased both the overall quantity and the percent of incoming material they recovered.

Materials Recovered by Processors for Reuse/Recycling

Figure 6 illustrates the basic types and quantities of materials that C&D material processing facilities were able to recover in 2013: asphalt shingles, aggregates (ABC), gypsum, clean wood, C&D wood, and metal.

- **Asphalt Shingles:** regionwide, asphalt shingles were the only material that was recovered in a greater total quantity in 2013 than in 2006, with a 52 percent increase. In 2006, Maine was the only state where facilities reported recovering asphalt shingles for recycling. By 2013, shingle recycling businesses were also operating in Connecticut and Massachusetts, and C&D materials processors in Connecticut, Massachusetts, and New Hampshire reported recovering shingles for recycling, in addition to Maine.
- **Aggregates (ABC):** recovery of ABC is not reported by facilities in Maine. The quantity of ABC recovered by facilities in Connecticut, New Hampshire, and Rhode Island in 2013 was less than in 2006. ABC recovery reported by facilities in Massachusetts increased by about 300 percent to almost 64,000 tons in 2013. The large quantities of ABC reported in 2006 and 2013 by facilities in New York almost certainly indicates that road and bridge project ABC is included. As noted above, NEWMOA staff tried to exclude data in the presentation from facilities that specialized in processing material from road and bridge projects, but it not always clear from the data provided by New York State DEC, and therefore this presentation does not undertake a region-wide comparison between 2006 and 2013 for aggregates.
- **Gypsum Wallboard:** region-wide, 82 percent less gypsum wallboard was recovered in 2013 as compared with 2006. Most of this reduction is due to facilities in New York that reported recovering over 35,000 tons of gypsum in 2006, which was reduced to under 1,000 tons in 2013. In 2013, the quantity of gypsum reported as recovered by facilities in Maine was approximately the same as in 2006, whereas increases were reported by facilities in Connecticut, Massachusetts, New Hampshire, and Rhode Island.
- **Clean Wood:** Reported recovery of unadulterated wood by C&D materials processing facilities was greater in 2013 than in 2006 in Maine, Massachusetts, New York, and Rhode Island. As noted above, the data presented in the figures on recovery of clean wood is influenced by NEWMOA's efforts to exclude facilities that process mainly land-clearing projects, and therefore this presentation does not undertake a region-wide comparison between 2006 and to 2013 for clean wood.
- **C&D Wood:** regionwide, 35 percent less C&D wood was recovered in 2013 as compared with 2006. Processors in Massachusetts were the only facilities to report an increase in the recovery of C&D wood between 2006 and 2013, from 21,000 tons to 130,000 tons. There were reductions in the quantity of C&D wood recovered at facilities in Maine, New Hampshire, New York, and Rhode Island between 2006 and 2013.
- **Metal:** regionwide, 16 percent less metal was recovered by C&D processing facilities in 2013 as compared with 2006. Processors in Massachusetts and Rhode Island reported an increase in the recovery of metal between 2006 and 2013, by 50 percent and 300 percent, respectively. Reductions in the quantity of metal recovered occurred at processors in Connecticut, New Hampshire, and New York between 2006 and 2013.

Overall Results

The management of C&D waste in the Northeast is regional, with facilities in each state importing and/or exporting C&D materials to each other for processing and/or disposal. All of the Northeast states export a portion of C&D materials for disposal, with some states relying more heavily on export for disposal to manage their C&D waste than others. For example, Connecticut, Massachusetts, New Jersey, New York, and Vermont sent a significant portion of the C&D waste out-of-state for disposal in 2013. Vermont relied on facilities in other NEWMOA-member states for export, and Connecticut, Massachusetts, New Jersey, and New York sent the majority of their C&D waste exports to facilities in non-NEWMOA states – primarily Pennsylvania and Ohio. The overall quantity of C&D waste sent for disposal was less in 2013 than in 2006 for C&D generated in all states except New York and Rhode Island. The quantity of C&D material that was sent for use at landfills (as ADC, shaping and grading, or road use) in 2013 decreased significantly from processors in Massachusetts and New York compared to 2006. However, in 2013 the quantity of material sent for landfill uses from processors in Maine, New Hampshire, and Rhode Island increased when compared to 2006.

The overall quantities of C&D materials sent to processing facilities in 2013 was less than in 2006 across all states. Processing of C&D materials and the quantities recovered for reuse and recycling are heavily dependent on available markets, which changed between 2006 and 2013 for virtually all reported materials. In 2013, facilities in Massachusetts were able to increase the quantity of all of the material types recovered for reuse and recycling (i.e., asphalt shingles, ABC, gypsum wallboard, clean wood, C&D wood, and metal) compared to 2006 even with the lower input tonnage. Recovery of C&D materials was down across all materials in the other states in 2013 compared to 2006 with the following exceptions where recovery tonnages increased: asphalt shingles in Connecticut and New Hampshire; gypsum wallboard in New Hampshire and Rhode Island; clean wood in Maine, New Hampshire, and Rhode Island; and metal in Rhode Island.

Reuse and recycling outlets for the various C&D materials and other market conditions are constantly evolving and, therefore, have changed since 2013.

About NEWMOA

The Northeast Waste Management Officials' Association ([NEWMOA](#)) is a non-profit, non-partisan, interstate association whose membership is composed of the state environment agency programs that address pollution prevention, toxics use reduction, sustainability, materials management, hazardous waste, solid waste, emergency response, waste site cleanup, underground storage tanks, and related environmental challenges in Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, and Vermont.

NEWMOA' mission is to provide a strategic forum for effectively solving environmental problems through collaborative regional initiatives that:

- Advance pollution prevention and sustainability
- Promote safer alternatives to toxic materials in products
- Identify and assess emerging contaminants
- Facilitate adaption to climate change and mitigate greenhouse gas sources

- Promote reuse and recycling of wastes and diversion of organics
- Support proper management of hazardous and solid wastes
- Facilitate clean-up of contaminant releases to the environment

NEWMOA's long term goals are to:

- Support and strengthen state efforts to implement policies, regulations, and programs
- Promote interstate coordination and develop innovative strategies to solve critical and emerging environmental problems
- Develop and enhance the capabilities and knowledge of state officials so that they are well trained, able to adjust to rapid changes in technology, and respond effectively to emerging environmental challenges
- Articulate state program views on federal policy developments, programs, and rulemakings
- Cultivate and enhance relationships among member states, federal agencies, colleges and universities, and stakeholders
- Engage with and educate the regulated community and the public

For more information, visit www.newmoa.org.

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Jennifer Griffith, NEWMOA Project Manager led this project and compiled the spreadsheet and prepared the presentation. Terri Goldberg, NEWMOA Executive Director supervised the project.

Disclaimer

The views expressed in this presentation do not necessarily reflect those of each of the NEWMOA-member states or the U.S. Environmental Protection Agency. Mention of any company, process, or product name should not be considered an endorsement by NEWMOA, NEWMOA-member states, or the U.S. EPA.

Figure 1: 2013 C&D Imports and Exports for Disposal (tons)

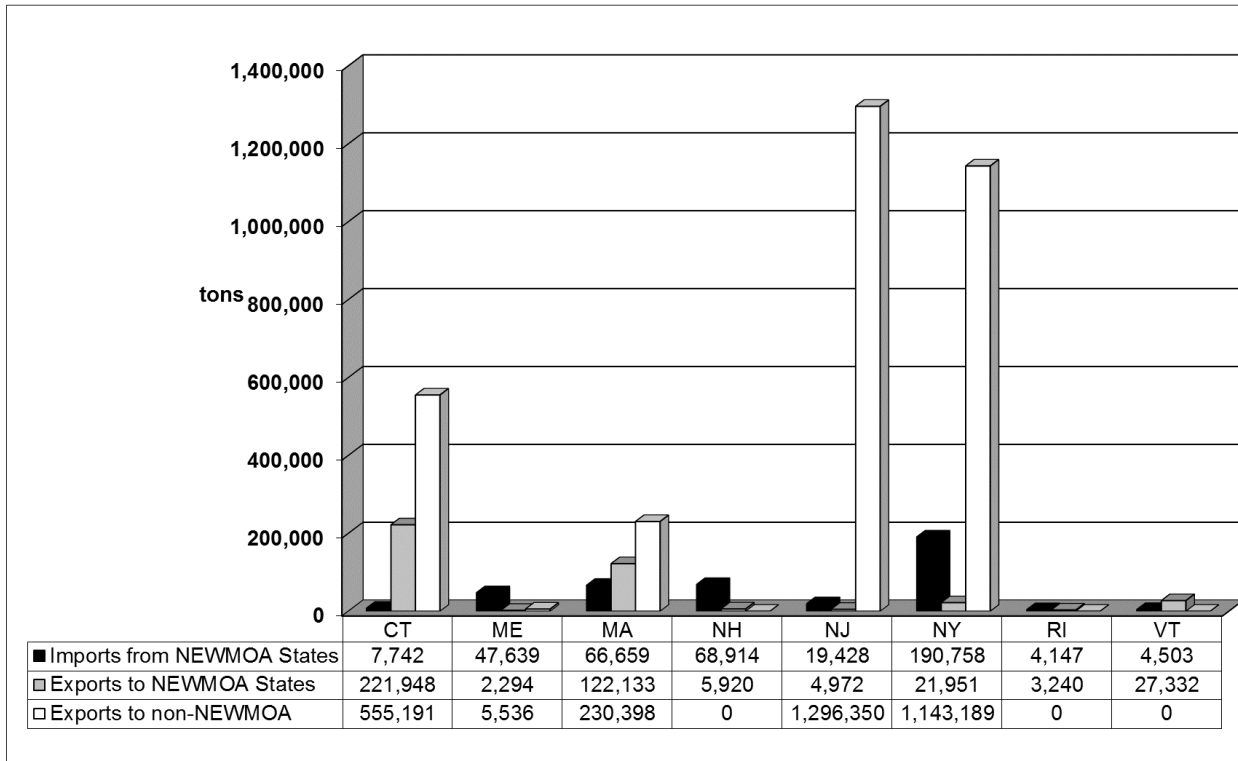


Figure 1: 2006 C&D Imports and Exports for Disposal (tons)

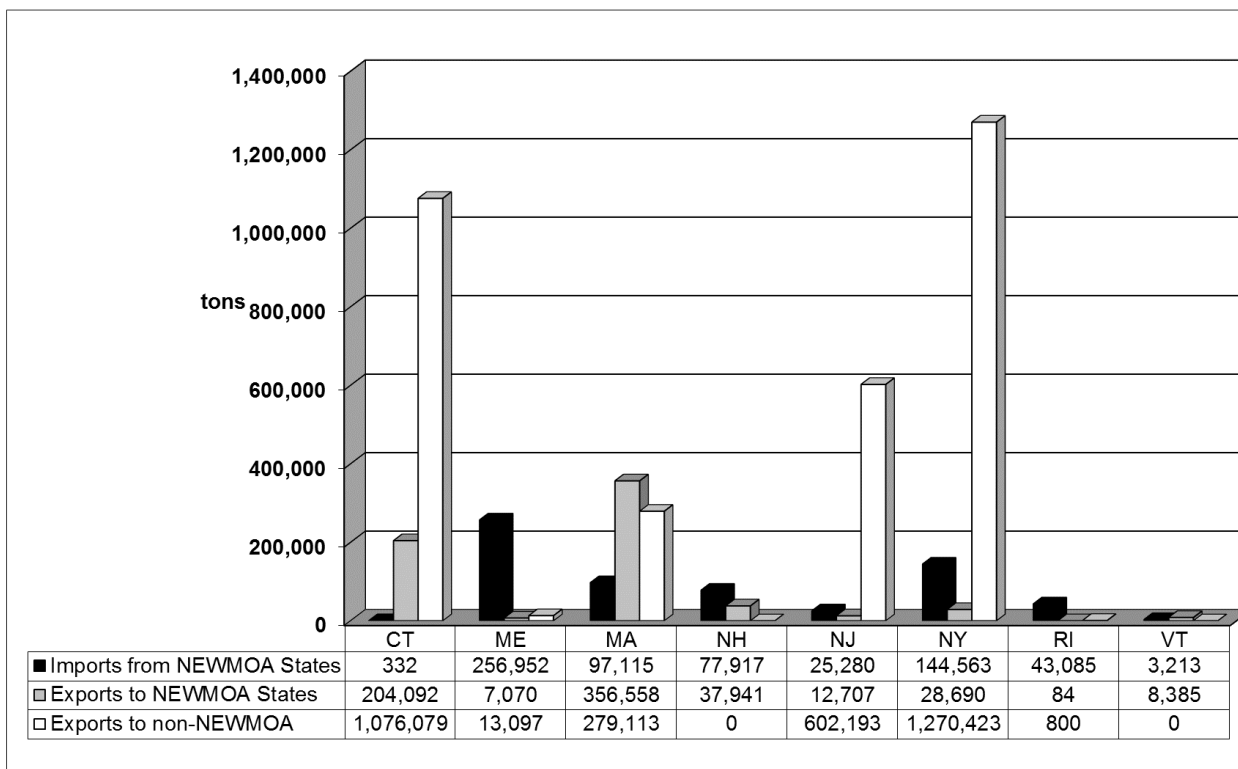


Figure 2: 2013 C&D Generated by State and Disposed (tons)

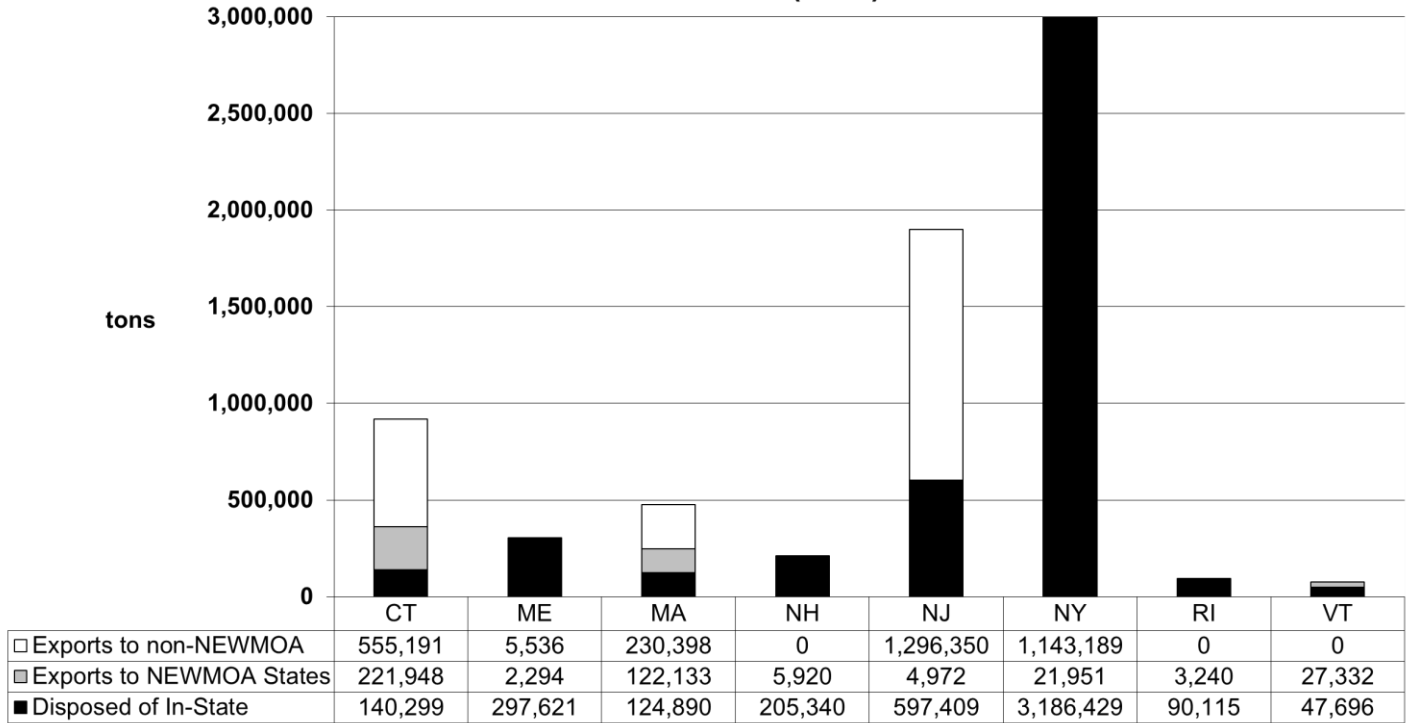


Figure 2: 2006 C&D Generated by State and Disposed (tons)

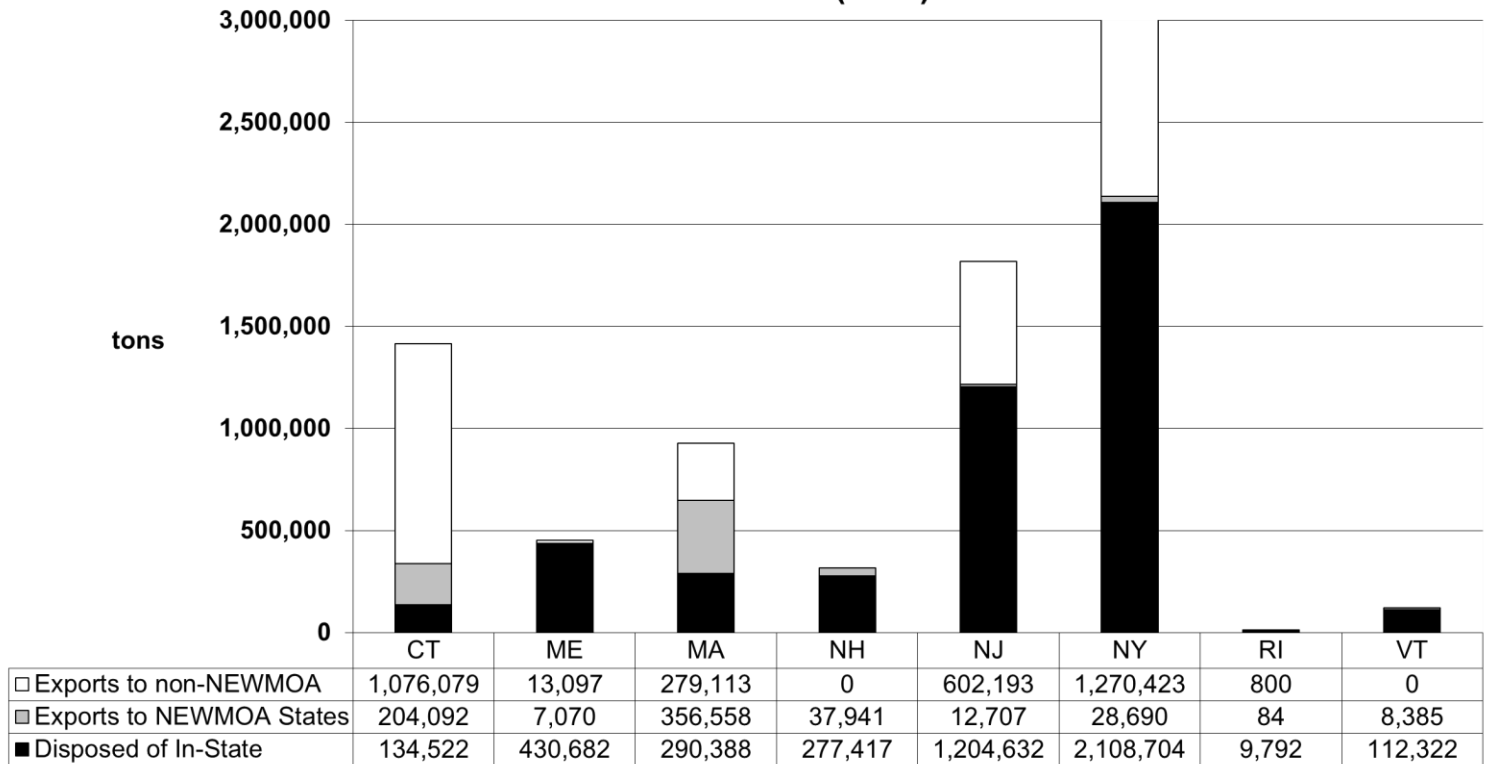


Figure 3: 2013 Total Quantity of C&D Disposed of In-State (tons)

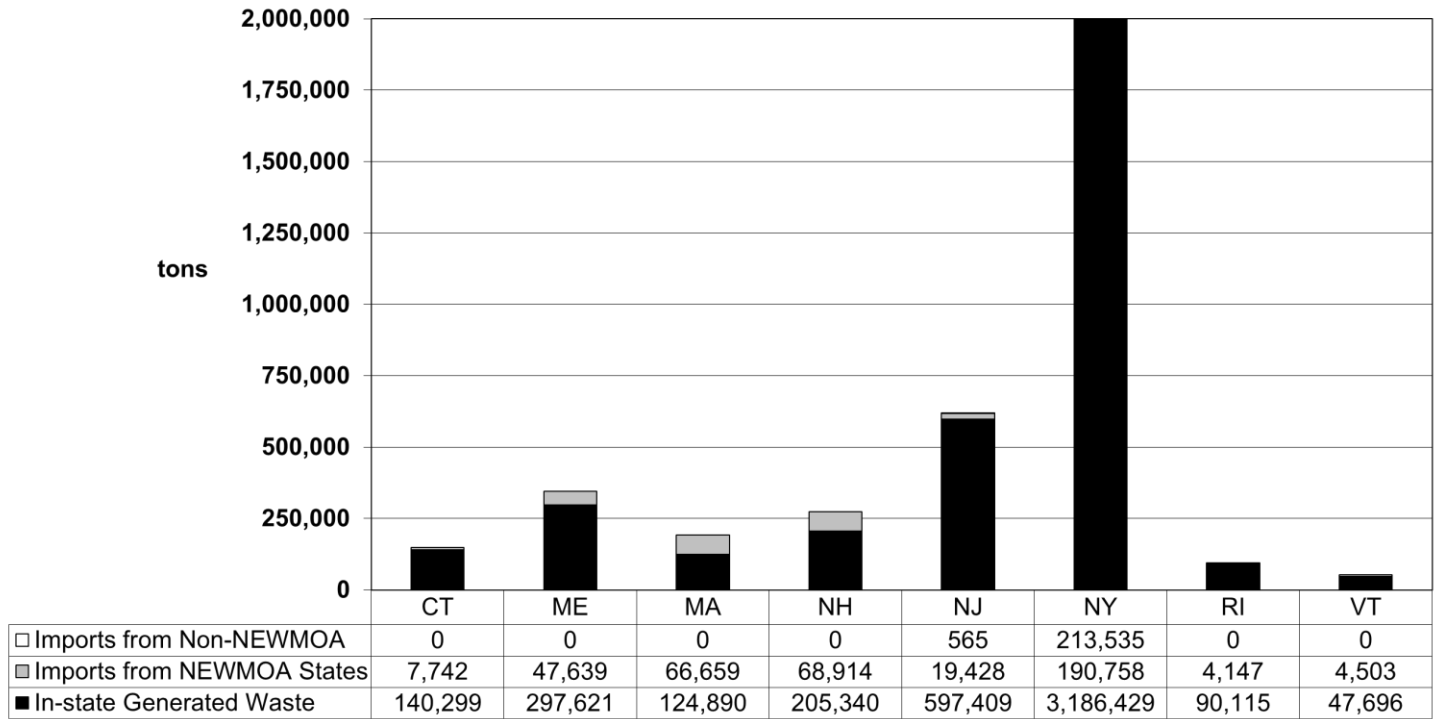
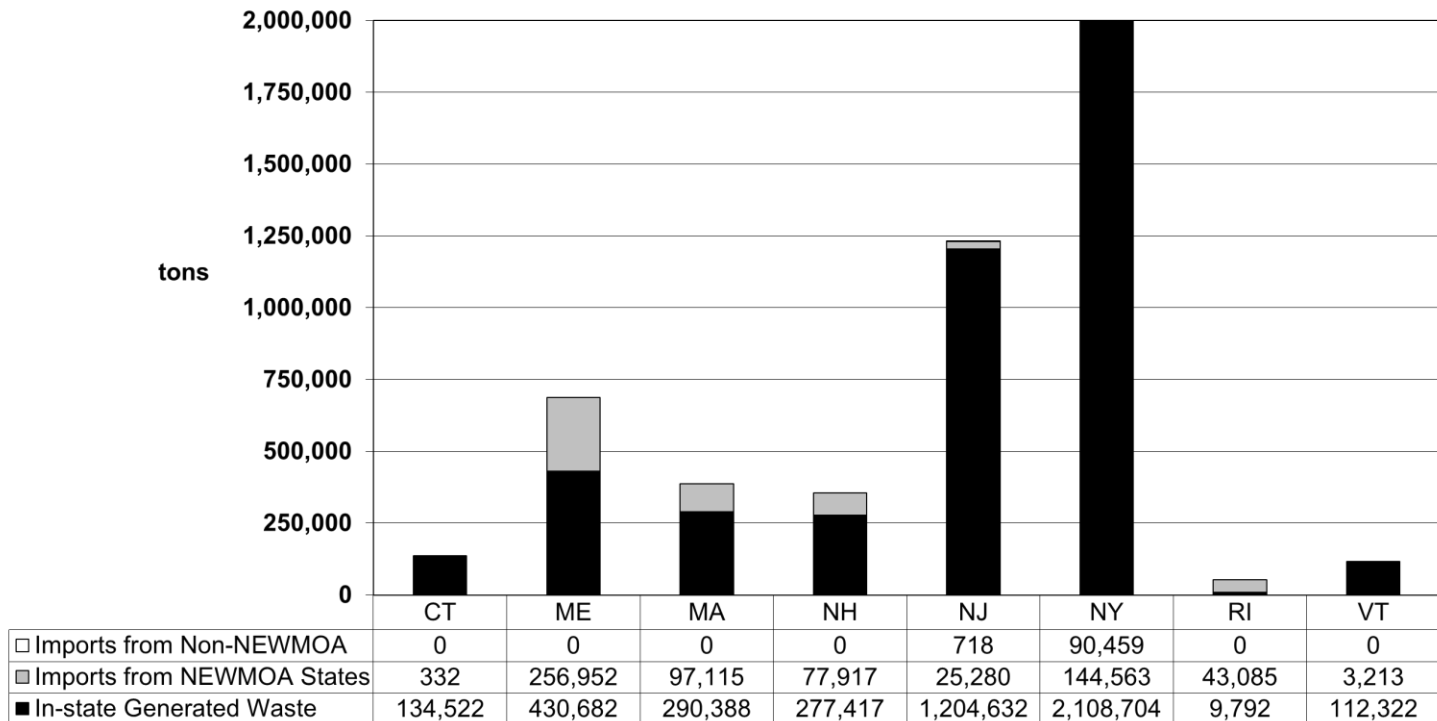
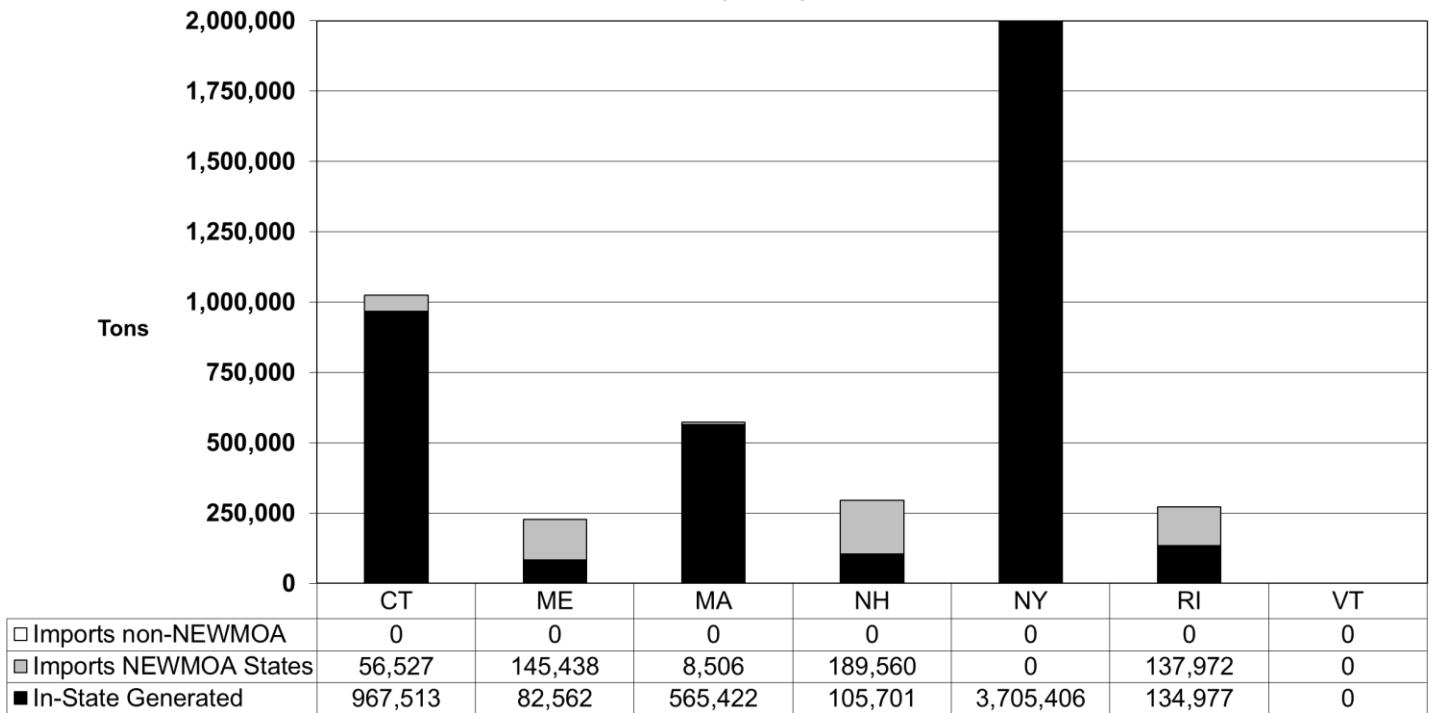


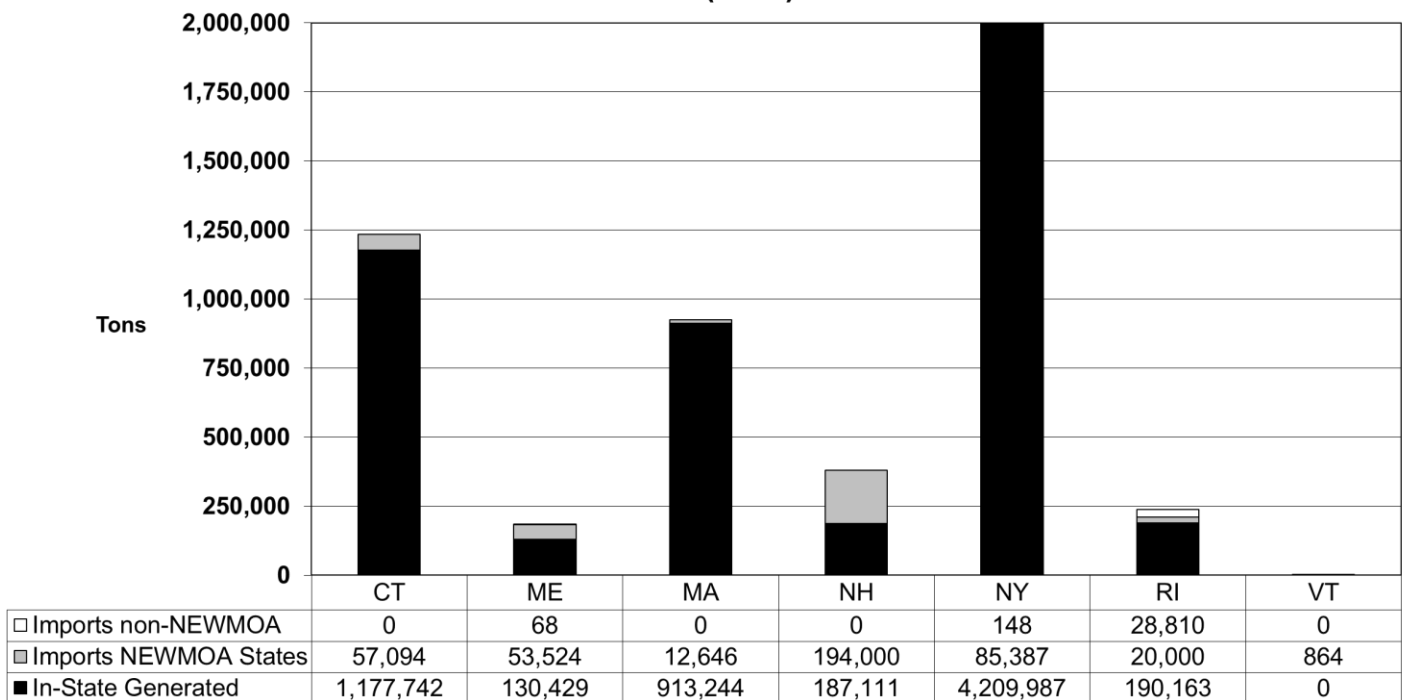
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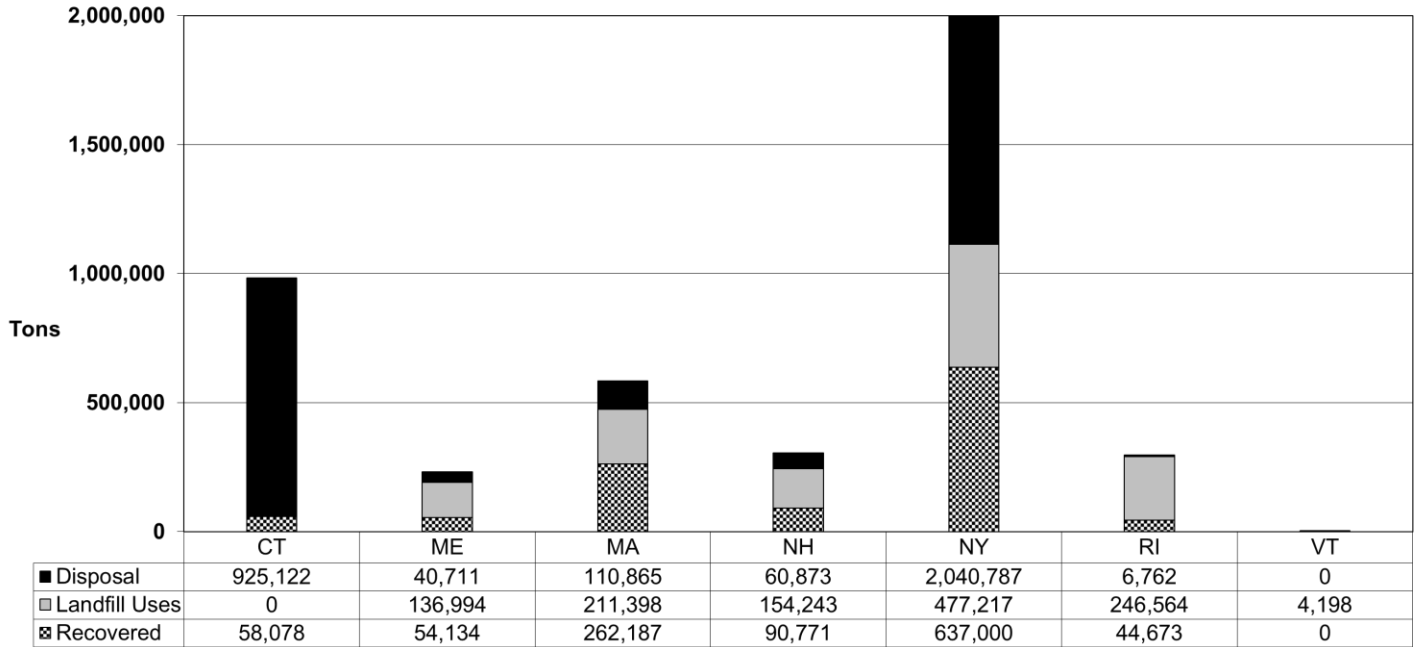
**Figure 4: 2013 C&D Inputs at Processors
(tons)**



**Figure 4: 2006 C&D Inputs at Processors
(tons)**



**Figure 5: 2013 C&D Processor Outputs
(tons)**



**Figure 5: 2006 C&D Processor Outputs
(tons)**

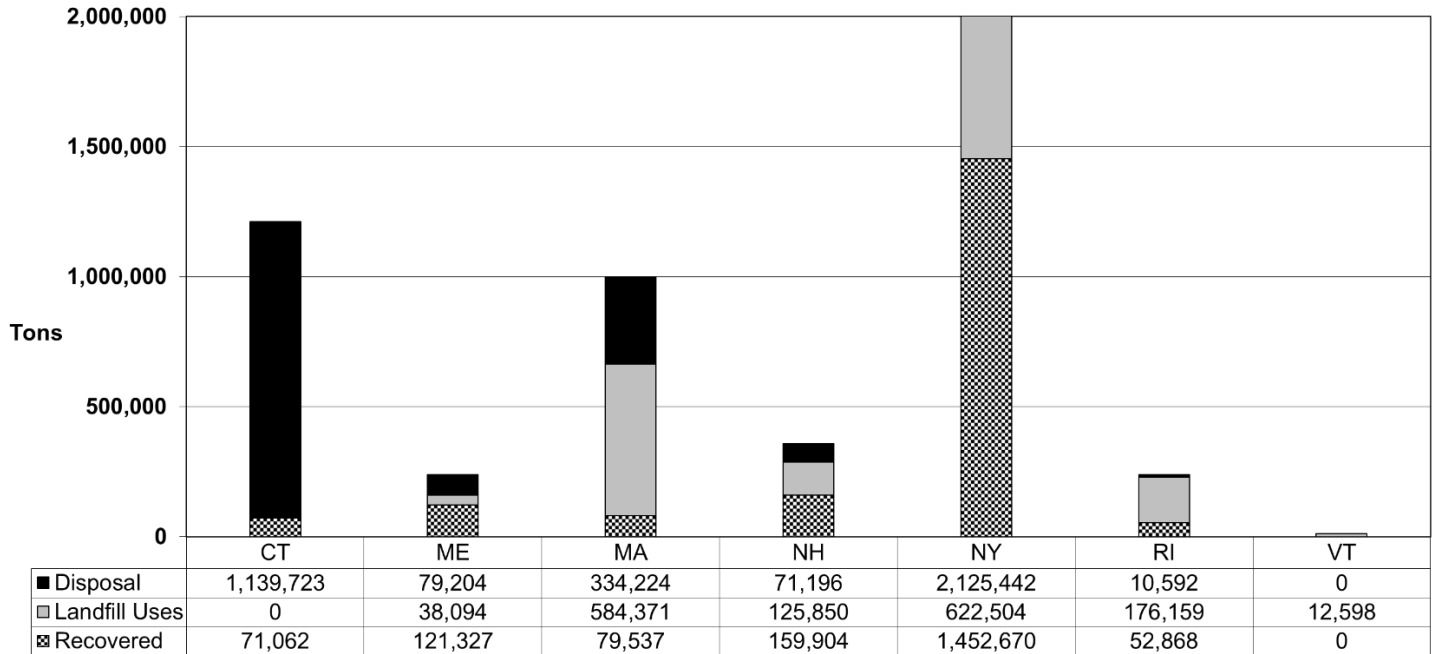


Figure 6: 2013 C&D Processor Recovered Outputs (tons)

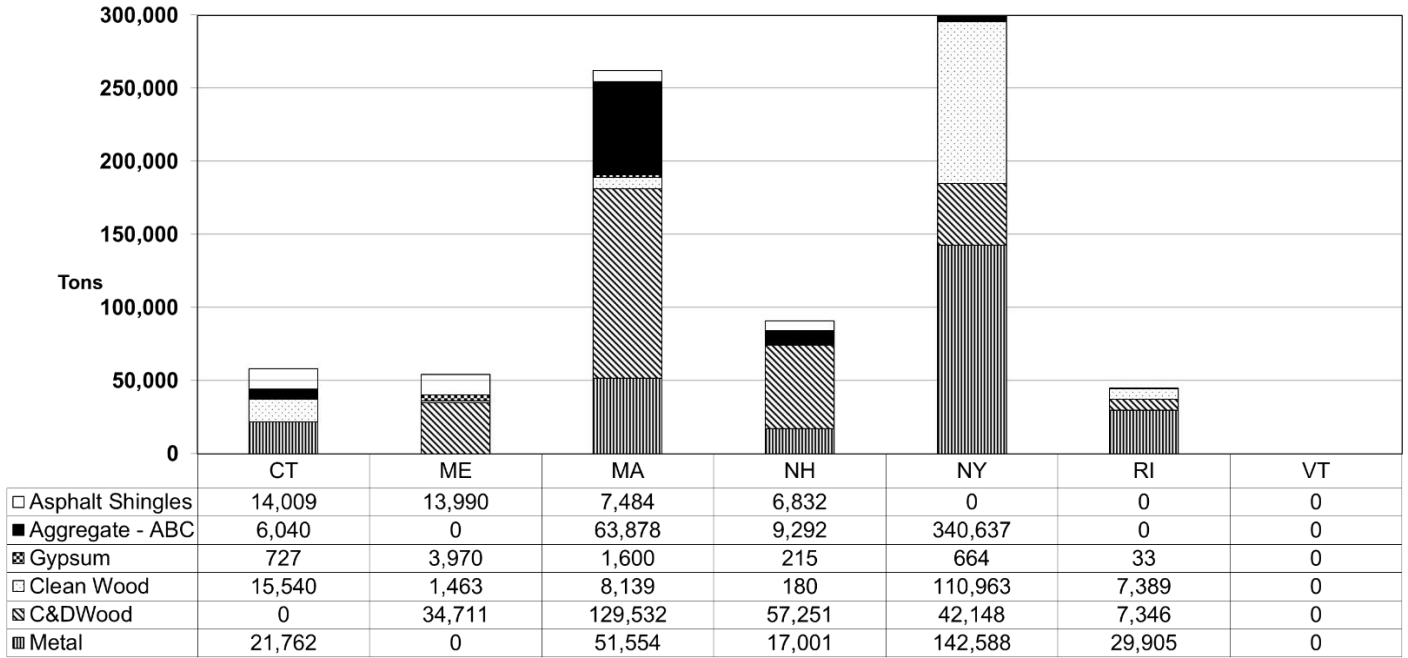


Figure 6: 2006 C&D Processor Recovered Outputs (tons)

